Charmed hybrids in proton antiproton annihilation
K. Peters 60
Open problems in low energy antineutron interactions
A. Filippi 65
New types of nuclear systems containing antibaryons
I.N. Mishustin 70

Antiprotonic Atoms

Atomic transition frequencies and primary populations of $\bar{p}He^+$ measured by ASACUSA
M. Hori 74
Auger-dominant metastable states in the antiprotonic helium atom
V.I. Korobov 80
Numerical accuracy of the energy levels of antiprotonic helium atoms
Y. Kino, M. Kamimura and H. Kudo 84
Study of the hyperfine structure of antiprotonic helium
J. Sakaguchi, J. Eades, R.S. Hayano, M. Hori, D. Horváth, T. Ishikawa, B. Juhász, H.A. Torii, E. Widmann, H. Yamaguchi and T. Yamazaki 89
Collisional effects on HFS transitions of antiprotonic helium
G.Ya. Korenman, N.P. Yudin and S.N. Yudin 94
Effects of impurity molecules on the lifetime of antiprotonic helium atoms
B. Juhász, J. Eades, R.S. Hayano, M. Hori, D. Horváth, T. Ishikawa, H.A. Torii, E. Widmann, H. Yamaguchi and T. Yamazaki 98

Antiprotons in the Universe

AMS, a particle spectrometer in space
C. Lechanoine-Leluc 103
BESS-Polar
M. Nozaki (for the BESS-Polar Collaboration) 110
The BALLOON-borne and PAMELA experiments for the study of the antimatter component in cosmic rays
P. Spillantini 116
Development of the gaseous antiparticle spectrometer for space-based antimatter detection
C.J. Hailey, W.W. Craig, F.A. Harrison, J. Hong, K. Mori, J. Koglin, H.T. Yu and K.P. Ziock 122

Atomic Collisions

The bus stop effect revisited
J.F. Reading and J. Fu 126
Collinear study of protonium formation in collisions of antiprotons with hydrogen molecular ions
K. Sakimoto 131
Ionization cross sections of helium and hydrogenic ions by antiproton impact
A. Igarashi, S. Nakazaki and A. Ohsaki 135
Hydrogen–antihydrogen atomic interaction at subKelvin temperatures
A.Yu. Voronin and J. Carbonell 139
Double-ionization of He by fast proton and antiproton impact
T. Morishita, T. Sasajima, S. Watanabe and M. Matsuzawa 144

Nuclear Physics

Future experiments on hypernuclei and hyperatoms
J. Pochodzalla 149
Theoretical prediction to double Λ hypernuclear spectroscopy with antiprotons
E. Hiyama. 153
Information on the nuclear periphery deduced from the properties of heavy antiprotonic atoms
A. Trzcińska, J. Jastrzębski, P. Lubiński, F.J. Hartmann, R. Schmidt, T. von Egidy and B. Kłos 157
Antiprotonic potentials from global fits to the PS209 data
E. Friedman and A. Gal. 160
Studies of the nuclear surface with antiprotonic atoms
S. Wycech 164
Depolarization and spin transfer in $\bar{p}p \to \bar{\Lambda}\Lambda$ with a polarized target
B. Bassalleck, A. Berdoz, C. Bradtke, R. Bröders, B. Bunker, H. Dennert, H. Dutz, S. Eilerts, W. Eyrich, D. Fields, H. Fischer, G. Franklin, J. Franz, R. Gehring, R. Geyer, S. Goertz, N. Hamann, J. Harmsen, J. Hauffe, F. Heinsius, D. Hertzog, T. Johansson, T. Jones, P. Khaustov, K. Kilian, P. Kingsberry, E. Kriegler, J. Lowe, A. Meier, A. Metzger, C. Meyer, W. Meyer, M. Moosburger, W. Oelert, K. Paschke, M. Plückthun, S. Pomp, B. Quinn, G. Reicherz, K. Röhrich, K. Sachs, H. Schmitt, B. Schoch, T. Sefzick, F. Stinzing, R. Stotzer, R. Tayloe and St. Wirth 167
Constraints on spin observables in $\bar{p}p \to \bar{\Lambda}\Lambda$
J.-M. Richard and X. Artru 171

Instrumentation and Facilities

The CERN antiproton decelerator (AD) in 2002: status, progress and machine development results
P. Belochitskii, T. Eriksson and S. Maury 176
Biological effectiveness of antiproton annihilation
C. Maggiore, N. Agazaryan, N. Bassler, E. Blackmore, G. Beyer, J.J. DeMarco, M. Doser, C.R. Gruhn, M.H. Holzscheiter, T. Ichioka, K.S. Iwamoto, H.V. Knudsen, R. Landua, W.H. McBride, S.P. Møller, J. Petersen, J.B. Smathers, L.D. Skarsgard, T.D. Solberg, U.I. Uggerhøj, H.R. Withers and B.G. Wouters 181
Positron storage ring for positronium and antihydrogen generation in flight: The LEPTA project
I.N. Meshkov, I. Seleznev, A. Sidorin, A. Smirnov, G. Trubnikov and S. Yakovenko 186
Medium energy antiproton absorption, a tool to study neutron halo nuclei
P. Kienle. 191
Technical developments toward antiprotonic atoms for nuclear structure studies of radioactive nuclei
M. Wada and Y. Yamazaki 196
Conceptual design and simulation of the PANDA detector
J. Ritman 201
Continuous Stern–Gerlach effect and the magnetic moment of the antiproton
W. Quint, J. Alonso, S. Djekić, H.-J. Kluge, S. Stahl, T. Valenzuela, J. Verdú, M. Vogel and G. Werth 207

Facilities and Summary

The future GSI facility
W.F. Henning 211
J-PARC project
S. Nagamiya 216

Author index 223